

MINISTRY OF LABOUR

SAFETY IN PAPER MILLS

**Joint Standing Committee for
Paper Mills**

FIRST REPORT



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MEMBERS OF COMMITTEE

Mr. H. Woods		H.M. Deputy Chief Inspector of Factories (Chairman)
Mr. M. W. Jackson	}	Representing The Employers' Federation of Papermakers and Boardmakers
Mr. M. Lambert		
Mr. K. N. Linforth		Representing The British Paper and Board Makers' Association
Mr. W. J. Binns, A.M.I.MECH.E.		Representing British Paper Machinery Makers' Association
Mr. E. B. White	}	Representing The National Union of Printing, Bookbinding and Paper Workers
Mr. J. Rossall		
Mr. G. W. Luck		Representing The Craftsmen's National Negotiating Committee (appointed December 1961)
Mr. R. K. Mawson, B.Sc., A.M.I.MECH.E.		H.M. Deputy Senior Engineering Inspector of Factories (Secretary)

LIST OF FORMER MEMBERS

Mr. H. A. Hepburn, C.B.E.	Chairman July 1949 - October 1953
Mr. T. W. McCullough, O.B.E.	Chairman May 1954 - November 1955
Mr. R. Bramley-Harker	Chairman May 1956 - January 1959
Mr. F. W. Thompson	Acting Chairman May 1959
Mr. J. McColl	Chairman November 1959
Mr. W. Holland	Representatives of the National Union of Printing, Bookbinding and Paper Workers
Mr. J. D. W. Shaw	
Mr. R. Dick, J.P.	
Mr. J. D. Kidd	Representative of The Paper Machinery Makers' Association
Mr. E. M. Amphlett, C.B.E., M.C.	Representative of The Employers' Federation of Papermakers and Boardmakers
Mr. E. W. Hodgson	H.M. Engineering Inspector of Factories (Secretary)

FIRST REPORT OF THE PROCEEDINGS OF THE JOINT STANDING COMMITTEE FOR PAPER MILLS

To: The Right Hon. Joseph Godber, M.P., Minister of Labour

Introduction

1 On 13th February, 1961 you appointed us, under your powers in section 26 of the Factories Act 1959, as a Joint Standing Committee for Paper Mills. Prior to this date there had been in existence a Joint Standing Committee for the Prevention of Accidents in Paper Mills which was appointed to advise H.M. Chief Inspector of Factories and we have felt that, on the occasion of this change, it would be appropriate that we should make a report as to the activities of the former Committee. In the remainder of this report, a reference to the Joint Standing Committee should be taken as being one to the Committee originally set up to advise H.M. Chief Inspector.

2 The Committee was appointed in 1949 and its first task was to review existing Rules for the Prevention of Accidents in Paper Mills adopted in 1937 and as a result of the review a new set of rules were agreed and published in 1952. Since that date the industry has been busily concerned in implementing these rules and we wish to place on record our appreciation of the very considerable expenditure of thought and money which has been made by those concerned with the running of the industry. In this connection we would refer not only to the actual managements of mills but also to the Federation of Papermakers and Boardmakers which has been very active in supporting the Agreed Rules, in seeking means of solving problems by the pooling of information and in other ways which are mentioned in greater detail later. The National Union of Printing, Bookbinding and Paper Workers has given full support to the work of this Committee and of the consequences flowing therefrom and we are again glad to place on record our appreciation of this marked spirit of co-operation. Our discussions and considerations of problems have also been considerably aided by the Paper Machinery Makers' Association whose representative has always been able to form a valuable link with those concerned in the manufacture of machinery for use in the industry. It is highly important that machinery manufacturers should give the greatest prominence to the provision of safety arrangements built into the machines before they are delivered to the user. At the same time, without the experience of the user it is often difficult for the maker to provide safety arrangements which will effectively meet the needs of safety while permitting the machines to be used in a proper and economic manner. We think therefore that the Committee has proved a useful channel of information between user and maker interests.

3 Throughout the period under review, the representation on the Committee has remained the same though individual members have changed. The same representation has been preserved under the new constitution and is as follows:

The British Paper and Board Makers' Association	1 Seat
The Employers' Federation of Papermakers and Boardmakers	2 Seats
The Paper Machinery Makers' Association	1 Seat

The National Union of Printing, Bookbinding and Paper Workers	2 Seats
The Craftsmen's National Negotiating Committee	1 Seat

The Chairman and Secretary have been provided by H.M. Factory Inspectorate

4 Following the issue of the Agreed Rules, the Committee has met in general twice a year and one interesting feature has been that alternate meetings have always been held at a mill. This has proved a very useful practice, for the members are able as a body to visit a mill at work and to note safety arrangements and at the same time it has proved of value that the workers should know that the Committee is actually visiting a mill to see the conditions under which they work. We understand that these visits are extremely welcome to the managements concerned and no difficulty has ever been experienced in finding a mill to visit. As far as possible moreover it has been the practice to visit small as well as large mills.

5 In our proceedings we have considered that the important duties laid upon us were the following:

- (a) To take note of the statistics of accidents arising from the use of machinery and to give particular attention to what may be termed the trouble spots.
- (b) To consider the advisability of amending the Agreed Rules or altering their application.
- (c) To consider applications from mills for relaxation from the Agreed Rules, and to make recommendations to H.M. Chief Inspector of Factories.
- (d) To make special recommendations for particular risks disclosed by accidents.

Accident statistics

6 In Appendix 1 we give tables showing the classified details of machinery accidents in the processes of paper and board making for the five years 1957 - 1961. In a period during which there have been considerable changes in the industry by the installation of new machinery, scrapping of older equipment, and introduction of new methods of material handling, the numbers of accidents appeared to show narrow limits of fluctuation between 1957 and 1959 but this pattern was disturbed in 1960 and 1961 when the levels rose. This disappointing trend underlines the need for further determined efforts to reduce the number of accidents. At certain parts of the paper making process, there are danger points which it has not so far been possible to guard effectively or to construct in such a way that danger cannot result. Much thought is being given by the industry to these problems and it is felt that the solutions are best reached by the pooling of information and experience and moving gradually towards a satisfactory solution. We would underline that the conditions from mill to mill vary greatly and we doubt whether there is any clear cut standard solution for these problems which might, for example, be derived from a research study.

Changes in the Agreed Rules

7 Experience in the application and understanding of the Agreed Rules has indicated the advisability of changes either in substance or in interpretation. On the whole we have felt it better to avoid as far as possible actual amendments of rules and to rely rather on the good offices of the Federation of Papermakers and Boardmakers to indicate to the industry changes in interpretation. We give below details of what has been done under this heading.

(1) RULE 2(a). PULPING MACHINES

As originally drafted there was an obscurity in this rule and especially in relation to an illustration purporting to show how the rule would be met. The wording of the rule was therefore altered to the following:

"The feed hopper of a pulping machine should be so constructed that it is not possible to reach the blades from the usual working position. When a machine is fed through an opening in a platform above the machine the opening should be fenced by an enclosure at least 3 feet high and so arranged as to prevent a person from reaching the opening."

(2) APPLICATION OF RULES TO BOARD MILLS

A point was raised as to whether the Rules applied to board mills in view of references in the Rules only to paper making machines. The Committee was satisfied that the rules were intended to be applied to board mills and were drafted in terms which made them appropriate to this part of the industry.

(3) RULE 9. FELT INTAKE

This rule deals with the risk known to exist at intakes between felts and stretching and guide rolls, and felts and felt drying cylinders accessible from beneath the paper machine drying cylinders. Evidence emerged as to a similar risk in some cases at wet felts and it was the view of the Committee that the rule should be amended so as to give it a wider application. This action was taken and the rule now reads:

"Where intakes between the felts and stretching and guide rolls or between felts and felt drying cylinders are within reach of any person working under the paper machine or standing on any scrap paper in the pit, guards should be provided at such intakes, unless there is no possibility of any person going below the machine, precautions having been taken by guarding or otherwise to prevent such access."

(4) RULE 11. FELT AND CYLINDER INTAKES

This rule deals with the prevention of injury when feeding paper by hand between the felt where it passes over a felt roller and the surface of the drying cylinder. The Rules require the provision of a space, at this point, of at least $4\frac{1}{2}$ inches between the surface of the felt roller and the surface of the drying cylinder. A similar point of risk was noted at a drying cylinder which did not form part of an actual paper making machine. An accident occurred at this point. It was agreed that this rule should be held to apply to a situation of this kind.

Difficulties in observing the Rules

8 The Rules provide that where there is an extreme difficulty in meeting any particular rule or part thereof, the mill concerned can make application to H.M. Chief Inspector of Factories for a relaxation. Such applications are normally considered by the Committee so that appropriate advice can be tendered to H.M. Chief Inspector. It was thought that this would be a very appropriate way of handling such matters; in particular it would give an opportunity for responsible representatives of the industry to assess the application in all aspects. We are glad to report that in fact very few applications have been received and in a number of instances the applicants have been successfully

persuaded to withdraw their applications and to make appropriate changes in their plant so as to permit of full observance of the Rules. This has often involved heavy expenditure in old mills and we are glad to note this willingness on the part of those concerned to amend plant in the interest of safety. The total number of applications received up to 30th June, 1961 has been 12 and of these five had been dealt with by issue of certificate and the remainder had been withdrawn as arrangements were made to comply with the Rules. It is the general practice when issuing certificates for these to be for a limited duration and for the matter to be reviewed from time to time.

Accidents to young persons

9 At an early stage in our proceedings we were concerned with the number of accidents which occurred to young persons and after careful consideration of the whole problem it was felt that a voluntary system of training and supervision of young persons should be adopted. The details of the agreed form of this recommendation are contained in Appendix 2. The recommendation covers the principal machines used in the making and finishing processes and, in regard to them, there is a prohibition on young persons from cleaning moving parts, moving guards or reaching behind guards, removing waste and "broke" by hand from surfaces of felts, webs, drying cylinders or rolls when in motion. We urged the importance of carefully observing the terms of this recommendation which seeks in a voluntary way to adopt the principles laid down in section 21 of the Factories Act 1961 with some extensions. We believe that the recommendation has brought results.

Accidents during shut-down of machinery

10 After noting the occurrence of some serious, and even fatal, accidents occurring to work-people during periods when machines which had been shut down for repair were re-started, either for purposes of test or for production without taking adequate safety precautions, we felt that the possibility of establishing rules of procedure should be explored. Draft basic proposals were circulated by the Federation to all mills and, as a result of observations and discussion, an agreed document was arrived at and considered by the Committee. With one or two minor changes, this procedure was adopted and circulated for observance by all mills. It is reproduced at Appendix 3. We think that this is a particularly valuable effort by the industry, bearing in mind the diversity of the plant and machinery involved. The basic features of the procedure are effective isolation of the part of the machine to be entered from the source of power, prohibition of entry except by the permission of a responsible person, effective withdrawal of persons from a machine before it can be run, and a check, before normal running is permitted, by the responsible person that all persons, tools and other gear have been withdrawn to places of safety and that the machine is fit to run.

Federation Safety Committee

11 In 1953 the Federation set up its own Safety Committee and, amongst other activities, this provides an excellent clearing house for problems thrown up by individual firms and for the dissemination of information of general value and importance. This Committee is of course not only concerned with machinery accidents but takes into its view all aspects of industrial injuries. The

Annual Report of the Safety Committee contains details of statistics as to accident distribution according to plant, frequency rates, activities of the Safety Committee and a report of the work of this Committee. In addition, the Federation holds an annual conference of members at which sessions are devoted to discussion of outstanding problems. There is no doubt that these opportunities for pooling information and experience are of great help in moving towards solutions of common problems.

New developments

12 In the course of modernisation and the introduction of new plant, a number of matters have arisen having a bearing on safety and we would mention as examples three cases:

(a) On high speed paper making machines, the conventional method of feeding paper by hand has had to be abandoned in favour of the development of mechanical systems of which the continuous rope feed is an example. Hand feeding of paper has been attended by some hazards and accidents, particularly in connection with the faster running machines. The application of the continuous rope feed to lower speed machines where hand feeding is still practicable has been undertaken in some cases. We welcome this development of mechanical methods of feeding machines. Where the paper leaves the drying section it is normally taken by hand to the calenders or reeler. In this part of the machine, rope feeds have not been used to any extent, if at all, but we have seen the development of air chutes which have, in their turn, reduced risk attendant on hand presentation to ingathering rolls such as the calenders.

(b) Super calenders of considerable size have had to be developed and the use of the normal fixed platforms and ladders has been abandoned in favour of hoist platforms which can be traversed over the face of the machine under the control of the operator. A number of precautions are necessary and the appropriate arrangements have been worked out and these appear in Appendix 4 as a further illustration of valuable guidance of a general nature.

(c) The breaking and preparation of large quantities of raw materials in readiness for beating and refining, is increasingly undertaken in what is broadly known as a modern slush pulper. This machine has introduced new hazards and we would underline that great care is needed in arranging feeding methods. There has been evidence that some installations have been undertaken without due regard to this point and in consequence it has been difficult to ensure, in such cases, that the safeguards against falling into these vessels are fully effective. We refer in particular to cases where the edge of the vessel has been level with the floor and horizontal conveyors have been used. On the other hand, we are glad to have noted the installation of very safe systems.

Future Work

13 As far as machinery accidents are concerned, outstanding hazards continue at drum reelers and at reeling and slitting machinery especially in regard to the latter at the intake between the reel and the rolls. We feel that much work remains to be done at these classes of machine before the safety precautions can be regarded as really satisfactory. We do not believe that there is a ready-made

solution to cover all phases of the industry but given a readiness to accept the existence of the problems and a readiness to work consciously towards a solution we are sure that this will be found.

(Signed) H. WOODS (*Chairman*).

W. J. BINNS.

M. W. JACKSON.

M. LAMBERT.

K. N. LINFORTH.

G. W. LUCK.

J. ROSSALL.

E. B. WHITE.

R. K. MAWSON (*Secretary*).

September, 1963.

APPENDIX 1 (see para. 6)

MACHINERY ACCIDENTS 1957-1961

(Figures in brackets indicate fatal accidents and these are included in the totals)

	1957	1958	1959	1960*	1961*
1. Power transmission and machine drives	17	17	15	13	13
2. Preparing machinery	19(1)	9	8(1)	11	8
3. Making machinery					
(a) Wet end to first drying cylinder	30(1)	25	27(1)	18	20
(b) Drying section	38	37(2)	31	52	55(3)
(c) Machine calendars	31	37	30	35	54
(d) Reel up	35	48	38	61	41(1)
4. Finishing machinery					
(a) Super calendars	12	9	7	16	11
(b) Reelers and re-reelers	38	48(1)	59	41	86
(c) Slitters	15	10	10	34	
(d) Winders	8	7	4	—	25
(e) Cutters	20	33	29	30	
(f) Glazing machines	—	1	2	4	58
(g) Dampers machines	4	1	—	1	
5. Other special cases	30	26(1)	33	58	
	297(2)	308(4)	293(2)	374	371(4)
6. Machines used for services	61	54(2)	60	46	43
TOTAL	358(2)	362(6)	353(2)	420	414(4)

* Note: In 1960, a change was made in the basis of classification which affects particularly items 5 and 6 and as a result the figures prior to 1960 are not strictly comparable with those for 1960 and 1961.

APPENDIX 2 (see para. 9)

TRAINING AND SUPERVISION OF YOUNG PERSONS ON CERTAIN MACHINES

A RECOMMENDATION from the Joint Standing Committee on the Prevention of Accidents in Paper Mills in connection with the employment of young persons on certain plant in paper mills, board mills and coating mills.

1 A young person for the purpose of this Recommendation is a person who has not attained the age of eighteen years.

2 Any young person who is engaged with a view to being employed on machinery referred to in the appendix hereto should, before being so employed, receive appropriate instruction on the general principles of safety and the avoidance of accidents.

3 On the first occasion when a young person is actually put to work on machinery to which this memorandum applies he should be carefully instructed as to his duties, what he must never do, and what he is not permitted to do until he has reached the age of 18 years and become more experienced. He should also have shown to him, and explained, those parts of the machinery which he must particularly avoid.

4 In order to ensure that these instructions and warnings are effective they should be repeated at the end of the first week and thereafter at appropriate intervals and particularly after any evidence that a particular young person is failing to pay proper attention to the instructions which have been given to him.

5 Similar procedure to that outlined above should be followed each time there is a change in the job of a young person employed on machinery to which this memorandum applies.

6 When a young person is employed on work to which this memorandum applies, he should be supervised by an adult who should see that he heeds the instructions and warnings that have

been given to him. (Note: Supervision for this purpose does not mean continuous supervision, as the adult concerned will have other work to do. It does, however, mean close oversight, particularly during the early days, of what the young person is doing and the manner in which he is doing it.)

7 It would be for each mill to list the appropriate points of instruction and warning in connection with particular machinery and the jobs on which a young person is likely to be employed. Without prejudice to the requirement of the Factories Act 1961, these shall in all cases include prohibition of the following:

- (a) Cleaning moving parts.
- (b) Moving guards or reaching behind guards.
- (c) Removing waste and "broke" by hand from surfaces of felts, webs, drying cylinders or rolls when in motion.

LIST OF MACHINES COVERED BY THE JOINT RECOMMENDATION

Paper making machines
Paper coating machines
Board making machines
Reelers
Slitters and re-winders
Cutters

NOTE: Guillotine machines, power presses including hydraulic presses, loose knife punching machines, wire stitching machines, milling machines (maintenance department) are already scheduled as dangerous machines and there is a statutory obligation on the employer to see that any person under the age of 18 employed on such machines is sufficiently trained and supervised (under section 21 of the Factories Act 1961).

APPENDIX 3 (see para. 10)

MEMORANDUM ON SAFE CONDITIONS FOR WORKMEN DURING SHUT-DOWN

"Shut-down" is taken to mean the period during which a paper making machine is closed for maintenance purposes.

1 Before any person enters any part of a machine for the purpose of cleaning, repair or adjustment during shut-down, that part shall not be in motion and shall be effectively isolated from the source of power.

2 The effective isolation shall ensure that any means of coupling power to the part of the machine in question shall be interrupted either by:

- (a) Removal of a link on a non-earthed conductor such as a fuse or the locking of starting switches where the drive is electrical

or

- (b) Removal of driving belts

or

- (c) The locking of a clutch (or removal of the operating handle)

or

- (d) Such other means as will ensure that the part in question cannot be brought into action without the agreement of a responsible person.

3 A system with effective precautions involving the use of individual danger plates is an acceptable alternative practice.

4 No workman shall enter any part of a paper making machine during shut-down without the permission of the responsible person. Entry for the purposes specified in Paragraph 1 shall be preceded by an inspection by the responsible person who shall ascertain that the effective isolation prescribed by Paragraph 2 has been completed and who shall then give permission to enter.

5 Where in the course of a shut-down it is desired to run part of a machine or the whole of it, e.g., for test purposes, the following precautions shall be observed.

- (a) All persons in or on the machine shall be withdrawn by the responsible person, except such men as the responsible person considers can safely remain at their place of work.
- (b) The source of power shall then be made available to the part which it is desired to run and it may then be run and such examinations and adjustments made as necessary.

- (c) Before there is any re-entry into a part of the machine (except to the extent referred to in (b) above), the responsible person shall again satisfy himself that effective isolation, as prescribed in Paragraph 2, has been carried out.

6 Before the machine or part thereof is connected to the source of power for normal running after maintenance, the responsible person shall see that all persons, tools and other gear are withdrawn to places of safety and shall satisfy himself that the machine is fit to run.

7 Responsible person.

The "responsible person" for purposes of this document is a person (or persons) specifically designated by the Management to assume the responsibility of ensuring that, as far as possible, these rules are effectively observed.

APPENDIX 4 (see para. 12(b))

TRAVELLING WORKING PLATFORMS AT SUPER CALENDERS

The following points arise in connection with these machines:

1 Trapping of persons by the underside of the descending platforms should be prevented. In some cases a three sided enclosure is provided (the calender forming the fourth side), to a height of about 7 feet above ground level, fitted with an interlocked gate. In other cases either a trip device is fitted under the platform to stop its descent should it meet an obstruction, or the platform is prevented from approaching within 6 feet of the ground. Trip devices should be tested regularly to ensure their effectiveness.

2 The edges of the platform should be protected to a height of at least 3 feet by an upper and intermediate rail and a toe board. An interlocked gate should be provided in this platform fencing.

3 In some cases there is a risk of persons travelling on the platform being trapped between the top platform handrail and fixed parts of the calender or structure such as roll adjusting screws, guide rolls etc. If sufficient clearance to prevent trapping cannot be provided at these points, a trip bar should be arranged above the top handrail where necessary so as to ensure that if a person is in danger of trapping, movement of the platform will be stopped in time to prevent injury.

4 Safe means of access to the platform should be provided. In cases where the platform does not approach within 6 feet of the ground, access is usually from an enclosed gangway, fitted with an interlocked gate to correspond with that on the platform.

5 Rope suspended platforms usually have one independent rope at each end of the platform; the clearance between the platform and guides is such that the platform would jam in its guides if one of the ropes broke. The combined factor of safety of the ropes should be not less than 12 (based on static loading). A spring operated safety gear is fitted under the platform of some imported machines because a positive means of operation is not feasible as there is no counter-weight. This safety gear is unlikely to be reliable unless it is particularly well maintained.

6 Slack rope switches should be provided on drum wound machines to prevent paying out of the ropes should the platform meet with an obstruction.

7 Automatic devices to prevent over-running should be provided at each end of the travel of the platform.

8 Control of this type of machine is usually by buttons on the floor of the platform or by a rod near the upper handrail on the calender side of the machine. If floor buttons are used they should be shrouded to prevent inadvertent operation.

9 Users would be well advised to have the whole machine examined every six months by a competent person.